

IJPEIJ et al  
Appl. No. 10/566,840  
May 29, 2007

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**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.-19. (Canceled).

20. (Currently Amended) A process for the polymerization of at least one aliphatic  $C_{2-20}$  or aromatic  $C_{4-20}$  hydrocarbyl mono- or multiolefin in the presence of a catalyst and a boron comprising co-catalyst, wherein the catalyst comprises a composition of an organometallic reagent, a spectator ligand (SH) and optionally at least one equivalent of a hydrocarbylating agent, and the organometallic reagent is represented by  $ML_jX_p$ , wherein

M is a metal from group 3-11, or the lanthanide series,

X is a monoanionic ligand bonded to M,

L is a neutral ligand bonded to M,

j represents an integer denoting the number of neutral ligands L, and

p is the valence of the metal M and

the spectator ligand is an imine ligand, or the HA adduct thereof, wherein HA represents an acid, of which H represents its proton and A its conjugate base

21. (Currently Amended) A process for the polymerization of at least one aliphatic  $C_{2-20}$  or aromatic  $C_{4-20}$  hydrocarbyl mono- or multiolefin in the presence of a catalyst and a boron comprising co-catalyst, wherein the catalyst comprises a composition of an organometallic reagent, a spectator ligand (SH) and optionally at least one equivalent of a hydrocarbylating agent, and the organometallic reagent is represented by  $ML_jX_p$ , wherein

M is a metal from group 3-11, or the lanthanide series,

X is a monoanionic ligand bonded to M,

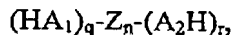
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L is a neutral ligand bonded to M,

j represents an integer denoting the number of neutral ligands L, and

p is the valence of the metal M,

and the spectator ~~hg-and~~ligand is represented by:



wherein

A<sub>1</sub> and A<sub>2</sub> are ~~monocyclic~~ cyclopentadienyl comprising ligands, with

q and r ~~representing~~represent an integer denoting the number of Cp ligands with q+r = 1 or 2, optionally linked by n parallel bridging groups Z, A<sub>1</sub>, A<sub>2</sub> separately, or bonded via Z together forming a bidentate diacidic spectator ligand, and

n is 1, 2 or 3.

22. (Currently Amended) A process for the polymerization of at least one aliphatic C<sub>2-20</sub> or aromatic C<sub>4-20</sub> hydrocarbyl mono- or multiolefin in the presence of a catalyst and a boron comprising co-catalyst, wherein the catalyst comprises a composition of an organometallic reagent, a spectator ligand (SH) and optionally at least one equivalent of a hydrocarbylating agent, and the organometallic reagent is represented by ML<sub>j</sub>X<sub>p</sub>, wherein

M is a metal from group 3-11, or the lanthanide series,

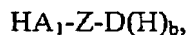
X is a monoanionic ligand bonded to M,

L is a neutral ligand bonded to M,

j represents an integer denoting the number of neutral ligands L, and

p is the valence of the metal M

and the spectator ligand is a ligand according to the formula:



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in which

A<sub>1</sub> is a delocalized  $\eta^5$  bonding cyclopentadienyl comprising ligand,

Z is a moiety comprising boron, or a member of Group 14, and optionally also sulfur or oxygen, said moiety having up to 20 non-hydrogen atoms, and optionally A<sub>1</sub> and Z together form a fused ring system,

D is a Lewis basic ligand bonded to Z, comprising a group 15 or 16 atoms and having up to 20 non-hydrogen atoms, or optionally D and Z together form a fused ring system and

b = 0 or 1.

23. (Currently Amended) A process for the polymerization of at least one aliphatic C<sub>2-20</sub> or aromatic C<sub>4-20</sub> hydrocarbyl mono- or multiolefin in the presence of a catalyst and a boron comprising co-catalyst, wherein the catalyst comprises a composition of an organometallic reagent, a spectator ligand (SH) and optionally at least one equivalent of a hydrocarbylating agent, and the organometallic reagent is represented by ML<sub>j</sub>X<sub>p</sub>, wherein

M is a metal from group 3-11, or the lanthanide series,

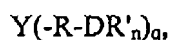
X is a monoanionic ligand bonded to M,

L is a neutral ligand bonded to M,

j represents an integer denoting the number of neutral ligands L, and

p is the valence of the metal M and

the spectator ligand<sub>s</sub> is represented by:



in which

Y represents a (substituted) cyclopentadienyl, (substituted) indenyl, (substituted) fluorenyl, (substituted) heterocyclopentadienyl, (substituted) heteroindenyl, (substituted)

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heterofluorenyl, or an imine group,

R is an optional bridging group between the Y moiety and the  $DR'_n$  ~~and/or Ar group~~,

D is a hetero atom selected from group 15 or 16,

R' is an optional substituent, ~~Ar an electron-donating aryl group~~,

n is the number of R' groups bonded to D and is 1 or 2, and, with

q is an integer  $q \geq 1$ .

24. (Currently Amended) A process for the polymerization of at least one aliphatic  $C_{2-20}$  or aromatic  $C_{4-20}$  hydrocarbyl mono- or multiolefin in the presence of a catalyst and a boron comprising co-catalyst, wherein the catalyst comprises a composition of an organometallic reagent, a spectator ligand (SH) and optionally at least one equivalent of a hydrocarbylating agent, and the organometallic reagent is represented by  $ML_jX_p$ , wherein

M is a metal from group 3-11, or the lanthanide series,

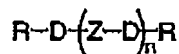
X is a monoanionic ligand bonded to M,

L is a neutral ligand bonded to M,

j represents an integer denoting the number of neutral ligands L, and

p is the valence of the metal M

and the ligand is represented by



wherein

Z is a bridging group, between two donor atom containing groups (D),

D is a group comprising a hetero atom chosen from group 15 or 16,

n is 0, 1, 2 or 3, and

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R is a substituent and wherein the metal is a metal from Group 7 - 11.

25. (Previously Presented) The process according to any of claims 20 to 24, wherein the hydrocarbylating agent comprises a metal or a metalloid chosen from group 1, 2, 11, 12, 13 or 14.

26. (Previously Presented) The process according to claim 25, wherein the hydrocarbylating agent comprises Li, Mg, Zn, or Al.

27. (Previously Presented) The process according to claim 26, wherein the hydrocarbylating agent is a C<sub>1</sub>-C<sub>20</sub> trihydrocarbyl aluminum or aluminoxane.

28. (Currently Amended) The process according to any of claims ~~20-24~~20 to 24, carried out in the presence of a base other than the hydrocarbylating agent.

29. (Currently Amended) The process according to claim 20, wherein the organometallic reagent comprises a group 4 metal and a cyclopentadienyl-comprising ligand.

30. (Previously Presented) The process according to claim 21 or 22, wherein the metal is a group 4 or group 5 metal, or a metal selected from the lanthanide series.

31. (Previously Presented) The process according to claim 23, wherein the metal is a group 4 metal with a valency of 3.

32.-35. (Canceled).